The Boeing Company
4501 E. Conant Street
Long Beach, CA 90808-1767

January 26, 2010

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Attention: Ms. Ana Townsend

Subject: **SUMMARY OF CHANGES FROM 2009, 2010 GROUNDWATER MONITORING WORKPLAN, FORMER C-6 FACILITY, 19503 SOUTH NORMANDIE AVENUE, LOS ANGELES, CALIFORNIA**

Dear Ms. Townsend:

The *2010 Groundwater Monitoring Work Plan, Former C-6 Facility, 19503 South Normandie Avenue, Los Angeles, California*, prepared by Avocet Environmental, Inc. (Avocet) for The Boeing Company (Boeing) was submitted to you via United Parcel Service on January 26, 2010. The document provided proposed updates and revisions to the Groundwater Monitoring Workplan (Workplan) schedule for routine sitewide groundwater monitoring to be conducted during calendar year 2010. This letter provides a brief summary of the changes to the 2010 Workplan from last year's program.

Changes include the following:

- Although this Work Plan has been simplified to describe only the Sitewide groundwater monitoring program, the site has also been subject to localized Waste Discharge Requirements (WDR) groundwater monitoring related to bioremediation pilot tests in the Building 1/36 and Building 2 source areas (WDR Order No. R4-2007-0040; Monitoring and Reporting Program (MRP) No. CI-9310). The sampling requirements of the Building 1/36 MRP were satisfied in September 2009 and the sampling requirements of the Building 2 MRP will be satisfied in March 2010. Seven of the eleven Building 1/36 and two of the six Building 2 WDR monitoring wells either were already included or are being transitioned into the 2010 Sitewide program for sampling in March and September, respectively. Future sampling requirements for these wells will be evaluated in the final WDR reports;
- A reduction in sampling frequency from semiannual to annual is proposed for three wells: two B-Sand (WCC_07S and WCC_12S) and one C-Sand (MWC004). Justification for this recommendation involves long-term stable or decreasing concentration trends of key contaminants in the wells and the presence of nearby plume-boundary wells. Concentration-versus-time graphs illustrating the water quality trends for these wells are presented in the Workplan;

The next sitewide groundwater monitoring event (Annual event) will occur in March 2010. Please let me know if you have any questions or concerns regarding the proposed changes to the Workplan for 2010. You can reach me at (562) 497-6157.

Sincerely,

Jennifer L. Wiley

Jennifer L. Wiley, P.G.
The Boeing Company

BOEING

2010 GROUNDWATER MONITORING WORK PLAN

Boeing Former C-6 Facility
19503 South Normandie Avenue
Los Angeles, California

January 26, 2010

PREPARED FOR

The Boeing Company
4501 Conant Street
Building 851, M/C D851-0097
Long Beach, California 90808

PREPARED BY

Avocet Environmental, Inc.
16 Technology Drive, Suite 154
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Project No. 1155.010

AVOCET ENVIRONMENTAL, INC.

AVOCET
ENVIRONMENTAL, INC.

January 26, 2010 Project No. 1155.010

Ms. Ana Townsend
CALIFORNIA REGIONAL WATER QUALITY
CONTROL BOARD, LOS ANGELES REGION
320 West 4th Street, Suite 200
Los Angeles, California 90013

2010 Groundwater Monitoring Work Plan
Boeing Former C-6 Facility
19503 South Normandie Avenue
Los Angeles, California

Dear Ms. Townsend:

Enclosed is the 2010 Groundwater Monitoring Work Plan for the subject site. If you have any questions or require additional information, please do not hesitate to call.

Respectfully submitted,

AVOCET ENVIRONMENTAL, INC.

Michael A. Rendina, P.G.
Principal

MAR:sh
Enclosure
cc: Ms. Jennifer Wiley – The Boeing Company (PDF only)
Mr. Joe Weidmann – Haley & Aldrich (PDF only)
Mr. Ravi Subramanian – CDM (PDF only)

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TABLE OF CONTENTS

AVOCET ENVIRONMENTAL, INC.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

bgs	below ground surface
B-Sand	Middle Bellflower B-Sand
Cal/OSHA	California Division of Occupational Safety and Health
CDM	Camp Dresser & McKee, Inc.
C-Sand	Middle Bellflower C-Sand
DO	dissolved oxygen
EPA	U.S. Environmental Protection Agency
HASP	Health and Safety Plan
ILM	Industrial Light Metals
LARWQCB	California Regional Water Quality Board, Los Angeles Region
LBF	Lower Bellflower aquitard
l/min	liter per minute
MBFM	Middle Bellflower Mud
mg/l	milligram per liter
ml	milliliter
ml/min	milliliter per minute
MRP	Monitoring and Reporting Program
mV	millivolt
NTU	nephelometric turbidity unit
OSHA	Occupational Safety and Health Administration
PID	photo-ionization detector
QA	quality assurance
QC	quality control
UBF	Upper Bellflower aquitard
µg/L	microgram per liter
VOC	volatile organic compound
WDR	Waste Discharge Requirement

1.0 INTRODUCTION

Avocet Environmental, Inc. (Avocet), on behalf of The Boeing Company (Boeing), has prepared this work plan for continuing groundwater monitoring at the Boeing Former C-6 Facility (the site) in Los Angeles, California (Figure 1). More than 50 groundwater monitoring events have been performed at the site since 1987 and two monitoring events are planned for 2010, as listed below:

- A site-wide annual event in March.
- A plume-boundary-specific semiannual monitoring event in September.
- If additional monitoring wells are installed during 2010, they will be added to the monitoring program and sampled for four consecutive quarters.

In addition to the site-wide groundwater monitoring described in this and previous versions of this work plan, the site has also been subject to localized groundwater monitoring related to ongoing bioremediation pilot tests in the Building 1/36 and Building 2 source areas in accordance with Monitoring and Reporting Program (MRP) No. CI-9310 and Individual Waste Discharge Requirements (WDR) Order No. R4-2007-0040. The sampling requirements of the Building 1/36 MRP were satisfied in September 2009 and the sampling requirements of the Building 2 MRP will be satisfied in March 2010. Results from the WDR monitoring program(s) will be submitted in separate reports. Certain of the former Building 1/36 and Building 2 WDR monitoring wells, as described in Section 2.0 of this work plan, will be transitioned into the site-wide program for monitoring in March and September, respectively. This work plan presents the site background, the groundwater monitoring wells that will be sampled and the constituents and parameters that will be measured during each event, and the reporting format and schedule.

1.1 BACKGROUND

The Former C-6 Facility comprises approximately 170 acres and is bounded by 190th Street to the north; Normandie Avenue to the east; former industrial parcels, including the Montrose Chemical Superfund site (Montrose), to the south; and the former Industrial Light Metals (ILM) site to the west (Figure 2). Between approximately 1952 and 1992, the site was used for aerospace manufacturing operations. Operations at the site ceased in the mid-1990s, the buildings were demolished, and most of the parcels were sold and redeveloped for commercial/ light industrial uses. Environmental studies conducted at the site since the 1980s indicate that groundwater beneath the site contains volatile organic compounds (VOCs). These VOCs have been the focus of past and continuing remediation efforts at the site.

1.1.1 Site Geology

The site is located on the Torrance Plain physiographic area of the West Coast Basin and is underlain by the Lakewood Formation. The Lakewood Formation is subdivided into two

principal hydrostratigraphic units: the Bellflower unit and Gage aquifer. The Bellflower unit is further subdivided into the following:

- Upper Bellflower aquitard (UBF)
- Middle Bellflower B-Sand (B-Sand)
- Middle Bellflower Mud (MBFM)
- Middle Bellflower C-Sand (C-Sand)
- Lower Bellflower aquitard (LBF)

The UBF comprises the upper 20 to 60 feet of the Bellflower unit and consists of fine-grained soils (predominantly fine sands, silts, and clays), which thicken to the east. A sandy zone (Middle Bellflower Sand) that dips downward to the east underlies the fine-grained soils. The Middle Bellflower Sand is generally 60 to 100 feet thick and is a massive, light yellowish-brown, fine to medium sand with discontinuous layers of fine-grained sediment (silt and clay) that also dip downward to the east. A fine-grained layer, referred to as the Middle Bellflower Mud (MBFM), locally interrupts this sand. The top sand subunits are referred to as the B-Sand and the bottom sand subunits as the C-Sand. The MBFM is discontinuous across the site, but where present, ranges in thickness from about 1 foot to 13 feet and is comprised of laminated clay, silt, and very fine sand. The MBFM thins toward the north and appears to be absent in the northern portion of the site (most of the former Building 1/36 portion of the site).

The Middle Bellflower Sand is underlain by the Lower Bellflower aquitard (LBF), another fine-grained zone, at depths ranging from about 120 to 140 feet below ground surface (bgs). The fine-grained LBF ranges in thickness from 10 to 20 feet and appears to be continuous across the site. The LBF separates the Middle Bellflower Sand from the underlying Gage aquifer.

1.1.2 Site Hydrogeology

Groundwater at the site is encountered at depths of approximately 55 to 65 feet bgs in the relatively permeable sediments of the Bellflower unit. Most of the groundwater monitoring wells at the site have been installed in the B- and C-Sands within the Bellflower unit. Four wells have been installed onsite within the underlying Gage aquifer.

The B-Sand is found at approximate depths of 55 to 70 feet bgs at the site and is generally 25 to 40 feet thick. The B-Sand consists of predominately interbedded fine sands and silts. The most recent (September 2009) groundwater monitoring data for the site (Avocet, November 24, 2009) indicate the groundwater flow within the B-Sand to be predominantly toward the south with an average gradient of 0.0008 ft/ft.

The C-Sand is found at approximate depths of 90 to 110 feet bgs at the site and extends to depths of 120 to 140 feet bgs. The C-Sand consists largely of interbedded very fine sands with silt and clay. Groundwater flow within the C-Sand is predominantly to the south, with an average gradient of 0.0008 ft/ft (Avocet, November 24, 2009).

The Gage aquifer in the site vicinity occurs at an approximate depth of 150 feet bgs and ranges in thickness from 40 to 50 feet (Haley & Aldrich, Inc., December 8, 2005). The Gage aquifer is comprised largely of sand. Groundwater flow within the Gage aquifer is generally to the southeast with an average gradient of 0.0005 ft/ft (Avocet, November 24, 2009).

1.2 GROUNDWATER MONITORING WELL SUMMARY

Groundwater wells installed at the site are classified as follows:

- Groundwater monitoring wells installed by Boeing and its predecessors in support of groundwater monitoring and bioremediation pilot testing (prefixes include AW, CMW, DAC, EWB, EWC, IRZ, IWC, MWB, MWC, MWG, TMW, and WCC).
- Groundwater monitoring wells installed by ILM for investigations at its facility (prefix BL).
- Groundwater monitoring wells installed by Montrose for investigations at its facility (prefix XMW).

Groundwater investigations began in early 1987 with the installation of the first groundwater monitoring wells. Over the years, numerous wells have been installed at the site as part of assessment and remediation programs conducted for both the former facility as well as for adjacent operations. To accommodate redevelopment, a number of wells were destroyed in accordance with regulatory guidance, though certain wells were replaced to maintain the monitoring record. As of March 2008, a total of 78 groundwater monitoring wells exist at the site; this includes two Montrose (XMW) wells and one ILM (BL) well that are included in the site-wide program. Completion details for all 78 groundwater monitoring wells are included in Table 1, and the well locations are shown in Figure 2.

More than 50 groundwater monitoring events have taken place at the site since monitoring began in 1987. All of the groundwater monitoring wells were typically sampled during each groundwater monitoring event, performed quarterly, until 1997. Between 1997 and 2000, while the facility was undergoing demolition and redevelopment, sampling continued, but on a more irregular basis as access was frequently constrained. In 2000, the groundwater monitoring program was modified to two events per year: one full annual monitoring event and one plume-boundary-specific semiannual monitoring event (Kennedy Jenks Consultants, Inc., December 15, 2000).

2.0 PROPOSED GROUNDWATER MONITORING PROGRAM

The proposed 2010 groundwater monitoring program consists of two sampling events:

- A site-wide annual event in March 2010.
- A plume-boundary-specific semiannual monitoring event in September 2010.

The above events are described in Sections 2.1 and 2.2. General monitoring considerations are described in Section 2.3. The monitoring program is presented in Table 2 and Figures 3 and 4. As stated previously, this monitoring is separate from, but may overlap, WDR-specific groundwater monitoring being performed at the site. At times during the monitoring events, sampling at certain wells will concurrently satisfy both groundwater monitoring and WDR-specific monitoring requirements. In addition, if any monitoring wells are installed during 2010, they will be added to the monitoring program and sampled for four consecutive quarters.

2.1 ANNUAL GROUNDWATER MONITORING

The site-wide annual monitoring event will be performed in March 2010. Groundwater monitoring will be performed at 52 groundwater monitoring wells and 10 bioremediation monitoring wells, as indicated in Table 2 and shown in Figure 3. This includes seven (EWB002, TMW_07, WCC_12S, MWB006, AW0055UB, AW0077UB, and AW0074UB) of the eleven Building 1/36 WDR monitoring wells that are being transitioned into the site-wide groundwater monitoring program. The four former Building 1/36 WDR monitoring wells that are not being transitioned into the site-wide program (AW0066UB, AW0067UB, AW0075UB, and AW0076UB) are located in such close proximity to the others that the information garnered from these wells is considered duplicative. Annual groundwater monitoring will consist of the following activities:

- Measure static groundwater in 67 groundwater monitoring wells.
- Measure field parameters, including pH, temperature, specific conductance, dissolved oxygen (DO), and redox potential, using a calibrated sonde and flow-through cell at 62 wells[1]. A turbidity meter (Hach 2100P or equal) will be used to periodically measure turbidity of the water during purging.
- Analyze 10 percent of the samples in the field using a CHEMetrics, Inc. test kit (K-7512 or K-7540) as a quality assurance (QA) check on DO measurements.

[1] The number of wells proposed for sampling (62) as part of the 2010 annual groundwater monitoring event reflects a three-well increase from the number proposed in the 2009 Groundwater Monitoring Work Plan (Avocet, February 17, 2009). Former Building 1/36 WDR amendment wells (AW0055UB, AW0074UB, and AW0077UB) account for these three wells; the other four former Building 1/36 WDR monitoring wells were already part of the annual site-wide program.

- Collect groundwater samples from the 62 monitoring wells and analyze for VOCs using U.S. Environmental Protection Agency (EPA) Method 8260B.
- Collect quality control (QC) samples consisting of duplicates (1 per 20 wells) and equipment/rinsate and trip blanks (each at a rate of 1 per day of sampling).
- Perform data validation on approximately 10 percent of the laboratory data for the primary samples as described in Section 2.3.7.4.

The monitoring methodology is presented in Section 2.3. If selected wells cannot be accessed for any reason, they will be scheduled for gauging and sampling during the next sampling event. Groundwater monitoring wells installed at the site by Montrose and ILM will be accessed through coordination with their respective environmental contractors.

2.2 SEMIANNUAL GROUNDWATER MONITORING

The semiannual monitoring event will be performed in September 2010. Groundwater monitoring will be performed at a reduced number (28)[2] of groundwater monitoring wells, as indicated in Table 2 and shown in Figure 4, and will focus primarily on the boundaries of the groundwater plumes. The wells scheduled for sampling include two (CMW002 and IRZCMW002) of the six Building 2 WDR monitoring wells that are being transitioned into the site-wide groundwater monitoring program. The four former Building 2 WDR monitoring wells that are not being transitioned into the site-wide program (CMW026, MWC024, IRZCMW001 and IRZCMW003) are not boundary area wells and future sampling requirements for these wells will be addressed in the final Building 2 WDR report due to the LARWQCB in October 2010. Semiannual groundwater monitoring will consist of the following activities:

- Measure static groundwater in 45 groundwater monitoring wells.
- Measure field parameters, including pH, temperature, specific conductance, DO, and redox potential, using a calibrated sonde and flow-through cell, at 28 wells. A turbidity meter will be used to periodically measure turbidity.
- Analyze 10 percent of the samples in the field using a CHEMetrics, Inc test kit (K-7512 or K-7540) as a QA check on DO measurements.
- Collect groundwater samples from 28 monitoring wells and analyze for VOCs using EPA Method 8260B.

[2] The number of wells proposed for sampling (28) reflects the addition of one former Building 2 WDR well (IRZCMW002 – the other former Building 2 WDR well was already part of the semiannual site-wide sampling program) and a reduction of three site-wide wells from the 30 proposed in the 2009 Groundwater Monitoring Work Plan (Avocet, February 17, 2009). The frequency of monitoring the three site-wide interior wells (two B-Sand: WCC_07S and WCC_12S and one C-Sand: MWC004) was reduced from semiannual to annual due to long-term stable or decreasing concentration trends of key contaminants and the presence of nearby plume-boundary wells. Concentration-versus-time graphs illustrating the water quality trends for these wells are presented in Appendix B.

- Collect QC samples consisting of duplicates (1 per 20 wells) and equipment/ rinsate and trip blanks (each at a rate of 1 per day of sampling).

- Perform data validation on approximately 10 percent of the laboratory data for the primary samples, as described in Section 2.3.7.4.

The monitoring methodology is presented in Section 2.3. If selected wells cannot be accessed for any reason, they will be scheduled for gauging and sampling during the next sampling event.

2.3 GROUNDWATER MONITORING METHODOLOGY

2.3.1 Health and Safety

The work will be performed by a qualified Boeing contractor under a site-specific Health and Safety Plan (HASP), which has been developed in accordance with the federal Occupational Safety and Health Administration (OSHA) and California Division of Occupational Safety and Health (Cal/OSHA) regulations (Title 29 CFR, Section 1910.120 and 8 CCR 5192).

2.3.2 Groundwater Monitoring and Sampling

Boeing or Boeing's authorized representative will notify the California Regional Water Quality Control Board, Los Angeles Region (LARWQCB) a minimum of one week prior to the start of groundwater monitoring events. The activities described in the subsequent paragraphs will be performed.

2.3.3 Water Level Gauging

Prior to sampling each monitoring well, depth to groundwater will be measured to the nearest one-hundredth of a foot using an electronic water level sounder. Data from the well gauging will be recorded in the Groundwater Monitoring Well Gauging Sheet (Appendix A), as well as in an electronic format for upload to the project database. Monitoring well vapor concentrations will be measured with a photoionization detector (PID) following the removal of the well cap, and the results will be recorded on the Gauging Sheet. The Gauging Sheet will also include information on the surface condition of each well and any repairs/modifications required or that may have been conducted. During each monitoring event, all water level measurements will be collected within a single 24-hour period using water sounding tapes calibrated to a common standard. Water levels in wells with submerged screens that are noted to be under pressure upon removal of the well cap will be allowed time to stabilize prior to water level gauging.

2.3.4 Well Purging

During each event, groundwater monitoring wells will be sampled in order of increasing concentrations. The sampling order will be determined based on the most recent groundwater analytical data available at the time of sampling and will consider any WDR wells included in the event.

Prior to collecting groundwater samples for chemical analysis, wells scheduled to be sampled will be purged to assure that representative samples are collected from the formation. Pursuant to a letter from the LARWQCB to Boeing, dated March 4, 2008, approving the use of low-flow methods for groundwater sampling, the wells will be purged for sampling using the low-flow (minimal drawdown) method. As summarized in Table 1, 40 of the site-wide monitoring wells are equipped with dedicated low-flow pneumatic bladder pumps (QED Well Wizard®), which will be used to purge and sample the wells. The remaining wells will be purged for sampling using portable low-flow equipment (QED Sample Pro®, or equivalent).

2.3.4.1 Low-flow Purging and Sampling

Low-flow purging differs from traditional methods of purging in that its use is based on the observation that water moving through the formation also moves through the well screen. Thus, the water in the screen is representative of the formation water surrounding the screen. Low-flow purging involves removing water directly from the screened interval without disturbing any stagnant water above the screen. This is done by pumping the well at a low enough flow rate to maintain minimal drawdown of the water column within the well, as determined through water level measurement during pumping. The objective is to pump in a manner that minimizes stress to the groundwater system to the extent practical. Pumping at low rates, in effect, hydraulically isolates the column of stagnant water in the well and negates the need for its removal prior to sample collection. Typically, flow rates on the order of 0.1 to 0.5 liter per minute (l/min) are used; however, this is dependent on site-specific and well-specific factors, as drawdown should be minimized to the extent possible. Pumping water levels in the well and water quality indicator parameters (such as pH, temperature, specific conductance, DO, and redox potential) should be monitored during pumping, with stabilization indicating that purging is completed (i.e., access to formation-quality water is confirmed) and sampling can begin.

Low-flow purging will be conducted using either portable or dedicated, pneumatic (bladder) or electric submersible pumps, as long as the pump has adjustable flow rate controls and is capable of being run at a low enough flow rate to avoid causing continuous drawdown in the well. The pump will be installed with the intake positioned near the mid-point of the well screen (or in water table wells near the mid-point of the saturated well screen interval). After the pump intake is properly set in the well, the pump will be started at a low pumping rate, generally 100 milliliters per minute (ml/min), or if 100 ml/min is not possible, the lowest flow rate possible. From the time the pump is started, the water level in the well will be measured periodically to determine the amount of drawdown caused by the pumping. The pumping rate may then be adjusted, either up or down, until drawdown stabilizes. Although several researchers have proposed limits on the amount of drawdown that should be allowed before stabilization occurs (e.g., 0.33 feet, Puls and Barcelona, 1996), none have provided any scientific rationale for the limits. ASTM International suggests that drawdown be limited to 25 percent of the distance between the top of the well screen and the pump intake; this equates to 1.25 feet in a well with 10 feet of saturated screen interval and the pump intake set at the screen midpoint. Since the objective of low-flow purging is to minimize stress on the formation to the extent

practical, and drawdown is a measurable indicator of stress, Avocet will endeavor to limit drawdown prior to stabilization to 0.5 foot or less.

Water quality indicator parameters, including pH, temperature, specific conductance, DO, and redox potential, will be measured in a closed flow-through cell to determine when purging is complete and sampling can commence. Though not a chemical parameter, turbidity is an indicator of stress on the formation and turbidity measurements will be recorded, at a minimum, once when pumping is initiated and again just prior to sample collection, after indicator parameters have stabilized. Indicator parameters will be considered stable when three consecutive readings made several minutes apart fall within the following ranges:

- ±0.2 pH units
- ±10 percent of the specific conductance measurement
- ±10 percent of the DO reading or ±0.2 mg/L, whichever is greater
- ±20 millivolts (mV) for redox potential measurements
- ±10 percent of the turbidity measurement or ±1.0 nephelometric unit (NTU), whichever is greater

The first reading will be recorded after stagnant water has been purged from the pump, discharge tubing, and one volume of the flow cell – about 1 to 2 liters depending on the volume of the flow cell. The frequency of subsequent measurements will be based on the time required to completely evacuate one volume of the flow cell to ensure that independent measurements are made. Historically, a QED MP20 flow cell, which has a volume of 175 milliliters (ml), has been utilized for parameter measurement; therefore, depending on the flow rate, measurements will be recorded every two minutes or less. Groundwater well purge information, including the equipment used, pump placement, initial static and final water levels, initial and final pumping rates, and water quality indicator and turbidity measurements, will be recorded on the Groundwater Sampling Data Sheet, an example of which is included in Appendix A.

2.3.5 Sampling

After drawdown and the chemical indicator parameters stabilize, sampling may begin. Sampling will be performed by disconnecting the inflow line from the flow cell and discharging the water directly into laboratory-supplied sample containers. Samples will be stored on ice in a cooler and transported by courier to a California-certified analytical laboratory for analysis under proper chain-of-custody protocols. Chain-of-custody forms will be maintained throughout sample collection and transport. An example chain-of-custody form is provided in Appendix A. The appropriate chain-of-custody information will also be electronically uploaded to the project database.

2.3.6 Miscellaneous

Nondedicated equipment used for well purging and sampling will be cleaned prior to and between groundwater monitoring wells with an Alconox solution (or equivalent), then double-rinsed with tap water and deionized or distilled water to reduce the potential for cross-contamination. Well purge water and water used to decontaminate equipment will be stored in properly labeled, UN-approved 55-gallon drums or other approved containers and stored onsite at a location selected by Boeing. The water will be properly manifested and disposed of by Boeing or Boeing's authorized representative following receipt of the laboratory results.

Groundwater analytical results will be reported on LARWQCB Laboratory Report Forms 10A/10B or their equivalent in units of milligrams per liter (mg/l) or micrograms per liter (µg/l), as appropriate. Field data will be collected and recorded on standard groundwater monitoring forms, and the laboratory data will be submitted electronically for upload to the project database.

2.3.7 Quality Assurance/Quality Control

2.3.7.1 Duplicate Samples

One duplicate groundwater sample will be collected for every 20 groundwater samples as a check for sample homogeneity and laboratory precision (three samples in March and two in September). Duplicates will be collected, packaged, and sealed in the same manner as the primary samples. Duplicates will be assigned separate sample numbers and submitted blind to the laboratory. Duplicate samples will be analyzed for VOCs using EPA Method 8260B.

2.3.7.2 Equipment/Rinsate Blanks

One equipment/rinsate blank sample will be collected each day throughout the duration of the sampling event, when nondedicated sampling equipment is cleaned and reused in the field, as a check for cross-contamination (an estimated four samples in March and two samples in September). Deionized water, provided by the laboratory and used to prepare the trip blanks, will be used to fill or rinse the sampling equipment after the equipment has been cleaned, then collected in sample containers. The equipment/rinsate blanks will be analyzed for VOCs using EPA Method 8260B.

2.3.7.3 Trip Blanks

One trip blank will be prepared in the laboratory for each cooler and each day that groundwater samples are collected and shipped to the laboratory (an estimated six samples in March and four samples in September). The trip blanks will be prepared in a clean environment and kept in the cooler(s) used to ship the samples. The trip blank provides a check for contamination during transport and will be analyzed for VOCs using EPA Method 8260B.

2.3.7.4 Data Validation

A subcontractor will perform data validation in accordance with EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA, 1999 and 2001).

Approximately 10 percent of the laboratory data for the primary samples will be reviewed during each monitoring event to verify that the data are of sufficient quality (six samples from the March annual event and three samples from the September semiannual event). The data packages to be validated will be selected randomly. Approximately 80 percent of the selected data packages will be subjected to Tier 1 validation, 10 percent will be subjected to Tier 2 validation, and 10 percent will be subjected to Tier 3 validation (Haley & Aldrich, March 28, 2006).

3.0 GROUNDWATER MONITORING REPORT

The report for the annual groundwater monitoring event will contain the following:

- Groundwater elevation contour maps for the B-Sand, the C-Sand, and the Gage aquifer
- Hydrographs for select B-Sand, C-Sand, and Gage aquifer wells
- Concentration-versus-time graphs for selected wells and trichloroethene (TCE) and 1,1-dichloroethene (1,1-DCE) in the B-Sand, C-Sand, and the Gage aquifer
- Groundwater isoconcentration maps for key compounds of concern at the site (TCE and 1,1-DCE) for the B-Sand and C-Sand
- Tables summarizing groundwater analytical results
- Groundwater sampling forms documenting field activities
- Laboratory reports and chain-of-custody documentation
- Data validation reports
- Appropriate descriptions of the field activities and analytical results
- Recommendations for modifications to the sampling program, as appropriate.

The report for the semiannual groundwater monitoring event will contain the following:

- Groundwater elevation contour maps for the B-Sand, the C-Sand, and the Gage aquifer
- Tables and figures presenting the groundwater analytical results
- Groundwater sampling forms documenting field activities
- Laboratory reports and chain-of-custody documentation
- Data validation reports
- Appropriate descriptions of the field activities and analytical results.

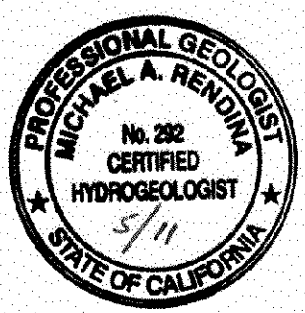
Reports will be submitted to the LARWQCB approximately 60 days after receipt of the laboratory results from each sampling event. With the annual and semiannual monitoring events occurring in March and September 2010, reports for these events will be provided to the

LARWQCB by May 28 and November 30, 2010, respectively. The reports will consist of a hard copy of text, tables, figures, and the appendices containing the field and laboratory data. The reports will also be uploaded over the internet onto the State Water Resources Control Board GeoTracker data management system.

Respectfully submitted,

AVOCET ENVIRONMENTAL, INC.

Michael A. Rendina, P.G.
Principal



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Tables

AVOCET
ENVIRONMENTAL, INC.

Table 1
Groundwater Monitoring Well Completion Details
Boeing Former C-6 Facility
Los Angeles, California

Well I.D.	Water-Bearing Unit	Easting[1,3]	Northing[1,3]	Reference Elevation (feet amsl)[2]	Boring Total Depth (feet)	Screen Depth Interval (feet)	Depth to Top of Filter Pack (feet)	Casing Diameter (inches)	Casing Type	Slot Size (inches)	Drilled Date	Dedicated Pump?[4]
B-Sand Monitoring Wells												
AW0055UB	Upper B-Sand	6,470,304	1,769,863	53.54	92	69 - 89	65	2	Sch 40 PVC	0.02	06/21/05	Yes
AW0064UB	Upper B-Sand	6,470,346	1,769,801	53.28	92	68.5 - 88.5	66	2	Sch 40 PVC	0.02	06/21/05	Yes[5]
AW0065UB	Upper B-Sand	6,470,316	1,769,802	53.64	92	68.5 - 88.5	66	2	Sch 40 PVC	0.02	06/16/05	Yes[5]
AW0066UB	Upper B-Sand	6,470,286	1,769,802	53.98	91	69.5 - 89.5	67	2	Sch 40 PVC	0.02	06/14/05	Yes[5]
AW0067UB	Upper B-Sand	6,470,261	1,769,810	54.01	91	70 - 90	67	2	Sch 40 PVC	0.02	06/08/05	Yes[5]
AW0074UB	Upper B-Sand	6,470,365	1,769,759	52.73	91	70 - 90	67	2	Sch 40 PVC	0.02	06/09/05	Yes
AW0075UB	Upper B-Sand	6,470,332	1,769,740	53.23	93	69 - 89	66	2	Sch 40 PVC	0.02	06/08/05	Yes
AW0076UB	Upper B-Sand	6,470,302	1,769,740	53.69	92	69 - 89	66	2	Sch 40 PVC	0.02	06/08/05	Yes
AW0077UB	B-Sand	6,470,254	1,769,763	53.96	86	70.5 - 85.5	69	2	Sch 40 PVC	0.02	08/19/04	Yes
BL-03	B-Sand	6,468,962	1,768,747	58.66	79	59 - 79	56	2	Sch 40 PVC	0.01	02/08/99	-[6]
DAC-P1	B-Sand	6,468,953	1,769,774	55.13	90	60 - 90	55	4	Sch 40 PVC	0.01	09/25/89	No
EWB001	B-Sand	6,470,381	1,769,604	49.14	84.7	59.2 - 89.2	56	6	Sch 80 PVC	0.02	11/09/06	No
EWB002	B-Sand	6,470,279	1,769,773	53.74	90	60 - 90	56	6	Sch 80 PVC	0.02	06/13/07	Yes
MW0005	B-Sand	6,470,232	1,769,063	52.1	85	65 - 85	63	4	Sch 40 PVC	0.01	08/08/03	No
MWB003	B-Sand	6,470,193	1,769,474	56.95	92	65 - 90	63	2	Sch 40 PVC	0.02	11/30/05	No
MWB006	B-Sand	6,470,251	1,770,051	53.9	93	65 - 90	63	2	Sch 40 PVC	0.02	12/01/05	Yes[5]
MWB007	B-Sand	6,470,211	1,770,213	51.39	92	60 - 90	57	4	Sch 40 PVC	0.02	06/06/05	Yes
MWB012	B-Sand	6,470,035	1,769,019	52.43	90.5	64.5 - 84.5	62	4	Sch 40 PVC	0.02	05/17/04	No
MWB013	B-Sand	6,469,592	1,769,396	55.33	86.5	65 - 85	62	4	Sch 40 PVC	0.02	05/17/04	Yes
MWB014	B-Sand	6,470,280	1,768,387	51.69	86.5	65 - 85	62	4	Sch 40 PVC	0.02	05/17/04	No
MWB019	B-Sand	6,469,970	1,768,093	55.18	90.5	65 - 85	62	4	Sch 40 PVC	0.02	05/17/04	Yes
MWB020	B-Sand	6,470,396	1,770,863	51.07	120.5	59.5 - 89.5	56	4	Sch 40 PVC	0.02	06/06/05	Yes
MWB027	B-Sand	6,469,948	1,769,934	57.14	91.5	67.5 - 87.5	65	2	Sch 40 PVC	0.02	11/30/05	Yes
MWB028	B-Sand	6,470,106	1,769,475	56.84	93	65 - 90	63	2	Sch 40 PVC	0.02	12/01/05	No
TMW_04	B-Sand	6,470,254	1,769,116	51.39	84	58 - 78	56	2	Sch 40 PVC	0.01	06/30/98	No
TMW_06	B-Sand	6,470,299	1,768,718	51.72	93	67 - 87	66	2	Sch 40 PVC	0.01	07/01/98	No
TMW_07	B-Sand	6,470,318	1,769,483	53.96	91	65 - 85	63	2	Sch 40 PVC	0.01	06/29/98	Yes
TMW_08	B-Sand	6,470,329	1,769,594	53.98	90	61 - 81	59	2	Sch 40 PVC	0.01	06/29/98	No
TMW_10	B-Sand	6,470,723	1,768,951	49.92	85	60.5 - 80.5	58	2	Sch 40 PVC	0.01	01/28/99	Yes
TMW_11	B-Sand	6,470,721	1,768,204	49.85	83	58 - 78	55	2	Sch 40 PVC	0.01	02/01/99	Yes
TMW_14	B-Sand	6,469,550	1,768,199	58.91	90	65 - 85	63	2	Sch 40 PVC	0.01	02/03/99	Yes
TMW_15	B-Sand	6,469,555	1,768,950	57.65	92	62 - 87	60	2	Sch 40 PVC	0.01	02/04/99	Yes

AVOCET ENVIRONMENTAL, INC.

Table 1
Groundwater Monitoring Well Completion Details
Boeing Former C-6 Facility
Los Angeles, California

Well I.D.	Water-Bearing Unit	Easting[1,3]	Northing[1,3]	Reference Elevation (feet amsl)[2]	Boring Total Depth (feet)	Screen Depth Interval (feet)	Depth to Top of Filter Pack (feet)	Casing Diameter (inches)	Casing Type	Slot Size (inches)	Drilled Date	Dedicated Pump?[4]
WCC_03S	B-Sand	6,470,367	1,770,021	52.8	92	69 - 89	64	4	Sch 40 PVC	0.01	10/26/87	Yes
WCC_04S	B-Sand	6,470,499	1,769,857	52.23	92	70.5 - 90.5	65	4	Sch 40 PVC	0.01	10/27/87	Yes
WCC_05S	B-Sand	6,470,722	1,769,779	52.82	91	61 - 91	64	4	Sch 40 PVC	0.01	11/24/87	Yes
WCC_06S	B-Sand	6,470,336	1,769,734	52.52	91	60 - 90	54	4	Sch 40 PVC	0.01	09/22/89	Yes[5]
WCC_07S	B-Sand	6,470,505	1,769,695	52.21	91	60 - 90	54	4	Sch 40 PVC	0.01	06/08/89	Yes
WCC_09S	B-Sand	6,470,683	1,769,409	54.96	92	60 - 90	55	4	Sch 40 PVC	0.01	09/21/89	Yes
WCC_12S	B-Sand	6,470,506	1,769,496	51.32	92	60 - 90	55	4	Sch 40 PVC	0.01	09/17/90	Yes
XMW-09	B-Sand	6,470,407	1,767,930	53.16	80	61 - 76	-	4	-	-	05/09/89	-[6]
XMW-19	B-Sand	6,470,722	1,768,538	49.38	80	62 - 77	-	4	-	-	03/30/90	-[6]
C-Sand Monitoring Wells												
AW0073C	C-Sand	6,470,329	1,769,765	53.42	117	96 - 116	93	2	Sch 40 PVC	0.02	06/09/05	Yes
CMW001	C-Sand	6,470,700	1,768,183	54.37	124	99 - 124	97	4	Sch 40 PVC	0.01	08/15/03	Yes
CMW002	C-Sand	6,470,554	1,767,936	52.81	124	99 - 124	97	4	Sch 40 PVC	0.01	08/14/03	Yes
CMW026	C-Sand	6,470,279	1,768,603	51.53	117	92 - 117	90	4	Sch 40 PVC	0.01	08/06/03	Yes
EWC001	C-Sand	6,470,359	1,769,706	52.59	125	97 - 122	94	4	Sch 80 PVC	0.02	11/08/06	No
EWC002	C-Sand	6,470,267	1,768,368	51.76	125	96 - 121	93	4	Sch 80 PVC	0.02	10/20/06	No
IWC001	C-Sand	6,470,121	1,768,453	53.05	125	95 - 115	92	4	Sch 80 PVC	0.02	11/02/06	No
IWC002	C-Sand	6,470,239	1,768,669	51.56	125	96 - 116	93	4	Sch 80 PVC	0.02	10/31/06	No
MWC004	C-Sand	6,470,486	1,769,491	51.86	118	96 - 116	93	4	Sch 40 PVC	0.02	06/07/05	Yes
MWC006	C-Sand	6,470,252	1,770,037	54.03	117.5	95 - 115	93	2	Sch 40 PVC	0.02	11/29/05	No
MWC007	C-Sand	6,470,172	1,770,172	51.57	119	97 - 117	93.5	4	Sch 40 PVC	0.02	06/03/05	Yes
MWC009	C-Sand	6,470,658	1,769,365	53.99	125	101 - 121	97.5	4	Sch 40 PVC	0.02	04/28/05	Yes
MWC011	C-Sand	6,470,263	1,769,749	54.03	117	94 - 114	92	2	Sch 40 PVC	0.02	11/29/05	No
MWC015	C-Sand	6,470,304	1,768,821	51.51	128	100 - 125	99	4	Sch 40 PVC	0.02	05/17/04	No
MWC016	C-Sand	6,469,987	1,768,720	52.61	131	102.5 - 127.5	101	4	Sch 40 PVC	0.02	05/17/04	No
MWC017	C-Sand	6,469,979	1,768,093	55.16	128	100 - 125	99	4	Sch 40 PVC	0.02	05/17/04	Yes
MWC021	C-Sand	6,470,705	1,768,939	54.53	126	97 - 122	94.5	4	Sch 40 PVC	0.02	05/17/04	Yes
MWC022	C-Sand	6,470,454	1,769,986	51.6	120	97 - 117	93.5	4	Sch 40 PVC	0.02	06/07/05	Yes
MWC023	C-Sand	6,470,428	1,769,802	51.43	120	97 - 117	94	4	Sch 40 PVC	0.02	06/07/05	Yes
MWC024	C-Sand	6,470,266	1,768,409	51.64	125	96 - 121	93	4	Sch 80 PVC	0.02	10/26/06	Yes
Bioremediation Monitoring Wells												
IRZB0081	B-Sand	6,470,037	1,768,714	52.92	-	64.5 - 89.5	63	0.75	Sch 40 PVC	0.01	09/04/03	No
IRZB0095	B-Sand	6,470,038	1,768,619	52.7	-	65 - 90	63.2	0.75	Sch 40 PVC	0.01	09/05/03	No

AVOCET ENVIRONMENTAL, INC.

Table 1
Groundwater Monitoring Well Completion Details
Boeing Former C-6 Facility
Los Angeles, California

Well I.D.	Water-Bearing Unit	Easting[1,3]	Northing[1,3]	Reference Elevation (feet amsl)[2]	Boring Total Depth (feet)	Screen Depth Interval (feet)	Depth to Top of Filter Pack (feet)	Casing Diameter (inches)	Casing Type	Slot Size (inches)	Drilled Date	Dedicated Pump?[4]
IRZMW001A	B-Sand	6,469,844	1,768,988	56.77	-	65 - 75	63	1.5	Sch 40 PVC	0.01	06/26/02	No
IRZMW001B	B-Sand	6,469,844	1,768,988	56.7	-	80 - 90	79	1.5	Sch 40 PVC	0.01	06/26/02	No
IRZMW002A	B-Sand	6,469,840	1,768,989	56.66	-	68 - 78	66	1.5	Sch 40 PVC	0.01	06/03/03	No
IRZMW002B	B-Sand	6,469,840	1,768,989	56.76	-	83 - 93	82	1.5	Sch 40 PVC	0.01	06/03/03	No
IRZMW003A	B-Sand	6,469,867	1,768,985	56.73	-	61 - 71	60	1.5	Sch 40 PVC	0.01	06/02/03	No
IRZMW003B	B-Sand	6,469,867	1,768,985	56.78	-	80 - 90	79	1.5	Sch 40 PVC	0.01	06/02/03	No
IRZMW004	B-Sand	6,470,051	1,768,610	53.06	-	65 - 90	63	4	Sch 40 PVC	0.01	09/04/03	No
IRZMW005	B-Sand	6,470,038	1,768,708	52.77	-	65 - 90	63	4	Sch 40 PVC	0.01	09/05/03	No
IRZCMW001	C-Sand	6,470,218	1,768,660	51.74	117	92 - 117	90	4	Sch 40 PVC	0.01	08/06/03	Yes
IRZCMW002	C-Sand	6,470,417	1,768,410	55.6	121	96 - 121	94	4	Sch 40 PVC	0.01	05/12/04	Yes
IRZCMW003	C-Sand	6,470,298	1,768,593	51.69	117	92 - 117	90	4	Sch 40 PVC	0.01	08/08/03	Yes
Gage Aquifer Monitoring Wells												
MWG001	Gage Aquifer	6,470,706	1,769,149	54.13	190	156 - 186	152	2	Sch 40 PVC	0.02	04/22/05	Yes
MWG002	Gage Aquifer	6,470,705	1,768,452	54.78	195	162 - 192	158	2	Sch 40 PVC	0.02	04/28/05	Yes
MWG003	Gage Aquifer	6,470,056	1,768,915	53.079	185	154.5 - 184.5	150	2	Sch 40 PVC	0.02	09/12/05	Yes
MWG004	Gage Aquifer	6,470,230	1,768,389	52.049	186	155 - 185	150	2	Sch 40 PVC	0.02	09/12/05	Yes

Notes:

(1) California State Plane North American Datum of 83 (NAD 83), Zone 5, Feet

(2) feet amsl = feet above mean sea level; elevations based on North American Vertical Datum of 1988 (NAVD 88)

(3) Coordinates were slightly revised based on additional survey done in November 2006

"-" = unknown

(4) Yes indicates that well is equipped with a dedicated QED Well Wizard® low-flow sampling pump.

(5) Plan to install dedicated QED Well Wizard® low-flow sampling pump prior to December 31, 2009.

(6) Indicates a well owned by an adjacent property owner and accessed under an agreement with Boeing.

AVOCET ENVIRONMENTAL, INC.

Table 2
2010 Groundwater Monitoring Program
Boeing Former C-6 Facility
Los Angeles, California

Well ID	Water-Bearing Unit	Dedicated Pump?	March 2010 Annual Event Analytical Program			September 2010 Semiannual Analytical Program		
			Water Level Gauging	VOCs (8260B)	Field Parameters[1]	Water Level Gauging	VOCs (8260B)	Field Parameters[1]
B-Sand Monitoring Wells								
BL-03	B-Sand	No	x	x	x	x		
DAC-P1	B-Sand	No	x	x	x	x		
EWB001	B-Sand	No	x	x	x			
EWB002	B-Sand	Yes	x	x	x			
MW0005	B-Sand	No	x	x	x			
MWB003	B-Sand	No	x	x	x			
MWB006	B-Sand	Yes	x	x	x			
MWB007	B-Sand	Yes	x	x	x	x	x	x
MWB012	B-Sand	No	x	x	x	x		
MWB013	B-Sand	Yes	x	x	x	x	x	x
MWB014	B-Sand	No	x	x	x	x		
MWB019	B-Sand	Yes	x	x	x	x	x	x
MWB020	B-Sand	Yes	x	x	x	x	x	x
MWB027	B-Sand	Yes	x	x	x	x	x	x
MWB028	B-Sand	No	x	x	x	x		
TMW_04	B-Sand	No	x			x		
TMW_06	B-Sand	No	x	x	x	x		
TMW_07	B-Sand	Yes	x	x	x			
TMW_08	B-Sand	No	x	x	x			
TMW_10	B-Sand	Yes	x	x	x	x	x	x
TMW_11	B-Sand	Yes	x	x	x	x	x	x
TMW_14	B-Sand	Yes	x	x	x	x	x	x
TMW_15	B-Sand	Yes	x	x	x	x	x	x
WCC_3S	B-Sand	Yes	x	x	x	x	x	x
WCC_4S	B-Sand	Yes	x	x	x	x	x	x
WCC_5S	B-Sand	Yes	x	x	x	x	x	x
WCC_6S	B-Sand	Yes	x	x	x			
WCC_7S	B-Sand	Yes	x	x	x	x	[2]	
WCC_9S	B-Sand	Yes	x	x	x	x	x	x
WCC_12S	B-Sand	Yes	x	x	x	x	[2]	
XMW-09	B-Sand	No	x	x	x	x	x	x
XMW-19	B-Sand	No	x	x	x	x	x	x
C-Sand Monitoring Wells								
CMW001	C-Sand	Yes	x	x	x	x	x	x
CMW002	C-Sand	Yes	x	x	x	x	x	x
CMW026	C-Sand	Yes	x	x	x			
EWC001	C-Sand	No	x	x	x			
EWC002	C-Sand	No				x		
IWC001	C-Sand	No	x	x	x	x		
IWC002	C-Sand	No						
MWC004	C-Sand	Yes	x	x	x	x	[2]	
MWC006	C-Sand	No	x	x	x			
MWC007	C-Sand	Yes	x	x	x	x	x	x
MWC009	C-Sand	Yes	x	x	x	x	x	x
MWC011	C-Sand	No	x	x	x	x		

AVOCET ENVIRONMENTAL, INC.

Table 2
2010 Groundwater Monitoring Program
Boeing Former C-6 Facility
Los Angeles, California

Well ID	Water-Bearing Unit	Dedicated Pump?	March 2010 Annual Event Analytical Program			September 2010 Semiannual Analytical Program		
			Water Level Gauging	VOCs (8260B)	Field Parameters[1]	Water Level Gauging	VOCs (8260B)	Field Parameters[1]
MWC015	C-Sand	No	x	x	x	x		
MWC016	C-Sand	No	x	x	x	x		
MWC017	C-Sand	Yes	x	x	x	x	x	x
MWC021	C-Sand	Yes	x	x	x	x	x	x
MWC022	C-Sand	Yes	x	x	x	x	x	x
MWC023	C-Sand	Yes	x	x	x	x	x	x
MWC024	C-Sand	Yes	x	x	x			
Gage Monitoring Wells								
MWG001	Gage	Yes	x	x	x	x	x	x
MWG002	Gage	Yes	x	x	x	x	x	x
MWG003	Gage	Yes	x	x	x	x	x	x
MWG004	Gage	Yes	x	x	x	x	x	x
Bioremediation Monitoring Wells								
IRZB0081	B-Sand	No						
IRZB0095	B-Sand	No						
IRZMW001A	B-Sand	No	x	x	x			
IRZMW001B	B-Sand	No	x	x	x			
IRZMW002A	B-Sand	No	x					
IRZMW002B	B-Sand	No	x					
IRZMW003A	B-Sand	No	x					
IRZMW003B	B-Sand	No	x					
IRZMW004	B-Sand	No	x	x	x	x		
IRZMW005	B-Sand	No	x	x	x			
IRZCMW001	C-Sand	Yes	x	x	x			
IRZCMW002	C-Sand	Yes	x	x	x			
IRZCMW003	C-Sand	Yes	x	x	x	x		
Quality Control Samples[3]								
Duplicates (1 per 20 wells)				x (3)			x (2)	
Rinseate Blanks (1 per day)[4]				x (4)			x (2)	
Trip Blanks (1 per day)				x (6)			x (4)	

Notes:

VOCs = volatile organic compounds using EPA Method 8260B

Field Parameters = pH, dissolved oxygen (DO), redox, turbidity, electrical conductivity, and temperature.

(1) As a quality assurance check on DO measurements, 10 percent of the samples will be analyzed in the field using a CHEMetrics, Inc test kit (K-7512 or K-7540).

(2) Sampling frequency reduced to annual due to long-term stable and/or declining concentration trends of key contaminants.

(3) Quality control sample number based on estimated number of sampling days.

(4) Since most of the wells have dedicated pumps/tubing, rinsate blanks will not be required every day.

AVOCET ENVIRONMENTAL, INC.

Figures

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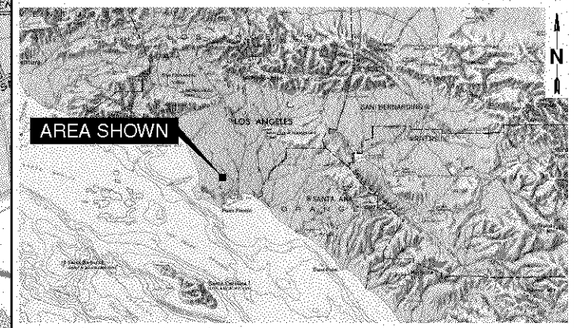
V:\1155_Boeing_Former_C-6\1155.010_2009_Groundwater_Monitoring_Reporting\001_1155.010_Site_Location_Maps\11/10/09

BOEING FORMER C-6 FACILITY

FORMER BUILDING 1/36 AREA



SITE VICINITY MAP

NOT TO SCALE

REFERENCE:
7.5 MINUTE U.S.G.S. TOPOGRAPHIC
MAP OF TORRANCE, CALIFORNIA
DATED: 1964
PHOTOREVISED: 1981

0 2000 4000 FEET

APPROXIMATE SCALE

FIGURE 1

SITE LOCATION MAP

THE BOEING COMPANY
FORMER C-6 FACIITY
LOS ANGELES, CALIFORNIA

AVOCET ENVIRONMENTAL, INC.

S:\GIS\1155_Boeing_C6\1155.010_Groundwater_Monitoring_2009\ArcMapDocuments\020_1155.010_All_Wells_11102009.mxd\11/10/09

0 300 600 FEET

LEGEND

- B-Sand Montrose Monitoring Well
- B-Sand ILM Monitoring Well
- B-Sand Monitoring Well
- C-Sand Monitoring Well
- Gage Monitoring Well
- Parcel Boundary

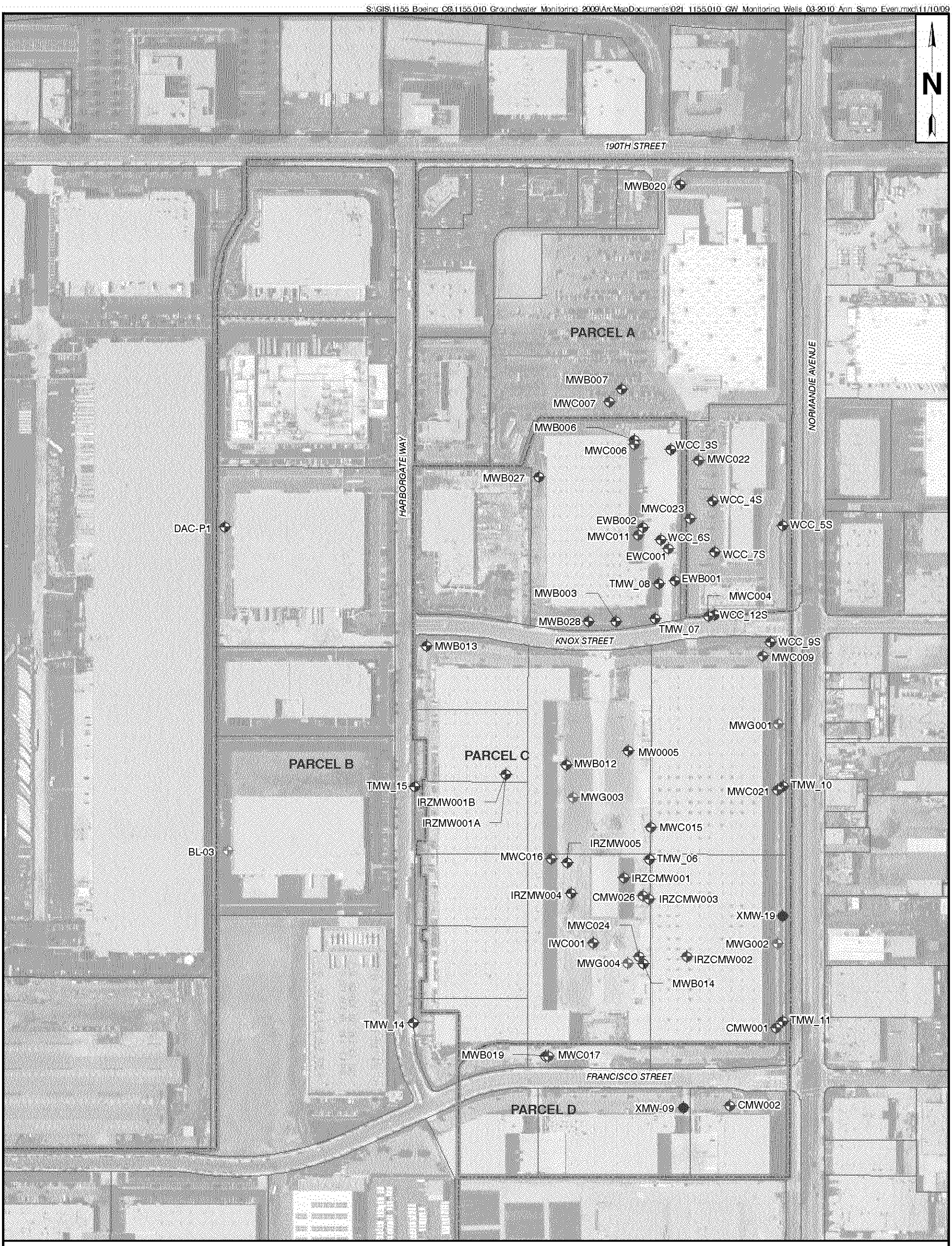
FIGURE 2

ALL GROUNDWATER MONITORING WELLS

THE BOEING COMPANY
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

AVOCET ENVIRONMENTAL, INC.

S:\GIS\1155_Boeing_C6\1155.010_Groundwater_Monitoring\2009\ArcMapDocuments\021_1155.010_GW_Monitoring_Wells_03-2010_Ann_Samp_Even.mxd\11/10/09



LEGEND

- B-Sand Montrose Monitoring Well
- B-Sand ILM Monitoring Well
- B-Sand Monitoring Well
- C-Sand Monitoring Well
- Gage Monitoring Well
- Parcel Boundary

0 300 600 FEET

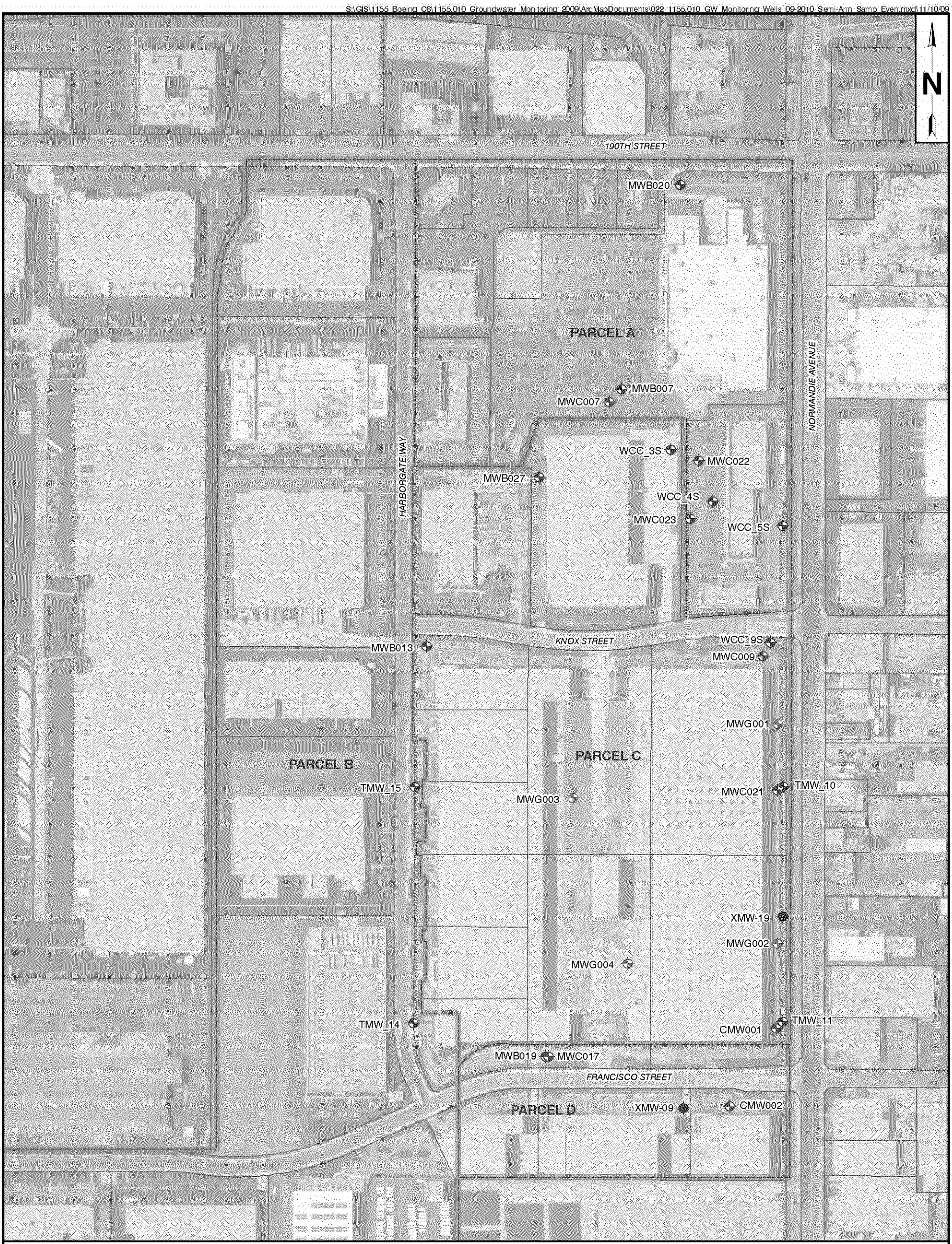
FIGURE 3

GROUNDWATER MONITORING WELLS MARCH 2010 ANNUAL SAMPLING EVENT

THE BOEING COMPANY
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

AVOCET ENVIRONMENTAL, INC.

S:\GIS\1155_Boeing_C6\1155.010_Groundwater_Monitoring_2009\ArcMapDocuments\022_1155.010_GW_Monitoring_Wells_09-2010_Semi-Ann_Samp_Even.mxd\11/10/09



LEGEND

- B-Sand Montrose Monitoring Well
- B-Sand Monitoring Well
- C-Sand Monitoring Well
- Gage Monitoring Well
- Parcel Boundary

0 300 600 FEET

FIGURE 4

GROUNDWATER MONITORING WELLS SEPTEMBER 2010 SEMIANNUAL SAMPLING EVENT

THE BOEING COMPANY
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA

AVOCET ENVIRONMENTAL, INC.

Appendix A

Field Forms

AVOCET
ENVIRONMENTAL, INC.

AVOCET ENVIRONMENTAL, INC.

GROUNDWATER SAMPLING DATA SHEET

Project Name:	Boeing C-6 Facility, Sitewide Annual Sampling, Sep-09	**Date:**	9/ /2009
Project No.:	1155.010	**Prepared by:**	
Well Identification:	MWB019	**Weather:**	
Measurement Point Description:		**Pump Intake:**	**Screen:** 65 - 85

A	*B*	*C*	*D* = *C - B*	*E* = *B - A*	*G* = *D x F*	H = *Screen x F*	I = (top screen – B) *x F*	
Depth to LNAPL (ft-bmp)	**Depth to Static Water Level** (ft-bmp)	**Well Total Depth** (ft-bmp)	**Water Column Height** (ft)	**LNAPL Thickness** (ft)	**One Casing Volume** (gallons)	**Screen Volume** (gallons)	**Above Screen Volume** (gal.)	**Total Purge Volume** (gal.)
					N/A	N/A	N/A	N/A

	Gallons/Foot				
Well Diameter (inches) = 4	0.75	2	4	6	**Field Equipment:** QED, Dedicated Low-flow
F - **Gallons per foot of casing**	0.02	0.16	0.65	1.47	**Purge Method:** Micropurge
					Well Condition:

Time	**Flow Controller Settings**	**Volume Purged** (Liters)	**Flow Rate** (mL/min)	**Water Level** (ft-bmp)	**Temperature** (°C) [+/- 10%]	**Conductivity** (mS/cm) [+/- 10%]	**Dissolved Oxygen** (mg/L) [+/- 10%]	**pH** [+/- 0.1 pH]	**ORP** (mV) [+/- 10%]	**Turbidity** (NTU) [+/- 10%]	**Observations**
Previous Stabilized Parameters: 03-13-09					20.30	3.15	5.130	6.75	72	0.80	

Purge Start Time	**Purge End Time**	**Average Flow** (mL/min)	**Total Volume Purged** (Liters)	**Total Casing Volumes Purged**	**80% Recovery Water Level Depth** (Dx0.20) + B	**Water Level at Sampling Time** (ft bmp)	**Sample Collection Time**	**Sample Identification**
				N/A	NA			**MWB019_WG200909 _01**

Notes: (units) [stabilization criteria]
Purging will continue until three consecutive measurements are within stabilization criterion.

Field Parameters

PID (ppm):

DUP: **MWB019_WG200909 _02**

DRUM NO:

AVOCET ENVIRONMENTAL, INC.

GROUNDWATER SAMPLING DATA SHEET

Project Name:	Boeing C-6 Facility, WDR Sampling, Sep-09	**Date:**	9/ /2009
Project No.:	1155.010	**Prepared by:**	
Well Identification:	WCC_06S	**Weather:**	
Measurement Point Description:		**Pump Intake:**	**Screen:** 60 - 90

A	*B*	*C*	*D* = *C* - *B*	*E* = *B* - *A*	*G* = *D* x *F*	H = *Screen* x *F*	I = (top screen – B) x *F*	
Depth to LNAPL (ft-bmp)	**Depth to Static Water Level** (ft-bmp)	**Well Total Depth** (ft-bmp)	**Water Column Height** (ft)	**LNAPL Thickness** (ft)	**One Casing Volume** (gallons)	**Screen Volume** (gallons)	**Above Screen Volume** (gal.)	**Total Purge Volume** (gal.)
					N/A	N/A	N/A	N/A

	Gallons/Foot				
Well Diameter (inches) = 4	0.75	2	4	6	**Field Equipment:** QED, Portable Low-flow
F - **Gallons per foot of casing**	0.02	0.16	0.65	1.47	**Purge Method:** Micropurge
					Well Condition:

Time	**Flow Controller Settings**	**Volume Purged** (Liters)	**Flow Rate** (mL/min)	**Water Level** (ft-bmp)	**Temperature** (°C) [+/- 10%]	**Conductivity** (mS/cm) [+/- 10%]	**Dissolved Oxygen** (mg/L) [+/- 10%]	**pH** [+/- 0.1 pH]	**ORP** (mV) [+/- 10%]	**Turbidity** (NTU) [+/- 10%]	**Observations**
Previous Stabilized Parameters: 03-11-09					21.88	3.91	8.020	7.72	-48.00	5.20	

Purge Start Time	**Purge End Time**	**Average Flow** (mL/min)	**Total Volume Purged** (Liters)	**Total Casing Volumes Purged**	**80% Recovery Water Level Depth** (Dx0.20) + B	**Water Level at Sampling Time** (ft bmp)	**Sample Collection Time**	**Sample Identification**
				N/A	NA			WCC_06S_WG200909 _01

Notes: (units) [stabilization criteria]
Purging will continue until three consecutive measurements are within stabilization criterion.

Field Parameters

Ferrous Iron (mg/L)	PID (ppm)

DUP:
DRUM NO:

AVOCET ENVIRONMENTAL, INC.

Groundwater Monitoring Well Gauging Sheet

Project Name: Boeing C-6 September 2009 Gauging Event **Project Manager:** Michael Rendina **Project No.:** 1155.010

Location: Torrance, CA **Field Personnel:** Various **Date:** 9/8/2009

CGI Instrument ID: RKI Eagle Multi-Gas Detector **PID Instrument ID:** MiniRAE 2000 **Solinst ID:** Various

Field Conditions: Partly cloudy and cool (mean temp. 70.5°F), calm to light winds (3 to 16 mph) from the west, 74% humidity.

Sampling Methods: Initial CGI/PID collected approx. 1" above center of casing immediately after opening. Measure elapsed time when CGI ≤ 2%LEL

Well ID	Previous Measurement Date	Previous Depth to Water	Time	Well Diameter	PID (ppm)	Initial CGI (%LEL)	Time to Disperse (mm:ss)	Measurement Point	Depth to Water	Depth to Water #2	Change in DTW	Comments/Well Conditon
BL-03	Mar-09	65.68						TOC-N				
DAC-P1	Mar-09	61.22						TOC-N				
AW0066UB	Mar-09	59.22						TOC-N				
EWB002	Mar-09	60.17						TOC-N				
AW0077UB	Mar-09	60.26						TOC-N				
AW0067UB	Mar-09	59.62						TOC-N				
AW0076UB	Mar-09	59.98						TOC-N				
AW0073C	Mar-09	59.71						TOC-N				
WCC_06S	Mar-09	58.75						TOC-N				
MWB027	Mar-09	63.2						TOC-N				
AW0065UB	Mar-09	58.95						TOC-N				
AW0064UB	Mar-09	58.64						TOC-N				
AW0075UB	Mar-09	59.66						TOC-N				
AW0074UB	Mar-09	59.11						TOC-N				
WCC_03S	Mar-09	58.92						TOC-N				
MWB006	Mar-09	60.05						TOC-N				
AW0055UB	Mar-09	59.85						TOC-N				
MWB028	Mar-09	63.38						TOC-N				
TMW_07	Mar-09	60.39						TOC-N				
MWB003	Mar-09	63.44						TOC-N				

AVOCET ENVIRONMENTAL, INC.

Groundwater Monitoring Well Gauging Sheet

Project Name: Boeing C-6 September 2009 Gauging Event **Project Manager:** Michael Rendina **Project No.:** 1155.010

Location: Torrance, CA **Field Personnel:** Various **Date:** 9/8/2009

CGI Instrument ID: RKI Eagle Multi-Gas Detector **PID Instrument ID:** MiniRAE 2000 **Solinst ID:** Various

Field Conditions: Partly cloudy and cool (mean temp. 70.5°F), calm to light winds (3 to 16 mph) from the west, 74% humidity.

Sampling Methods: Initial CGI/PID collected approx. 1" above center of casing immediately after opening. Measure elapsed time when CGI ≤ 2%LEL

Well ID	Previous Measurement Date	Previous Depth to Water	Time	Well Diameter	PID (ppm)	Initial CGI (%LEL)	Time to Disperse (mm:ss)	Measurement Point	Depth to Water	Depth to Water #2	Change in DTW	Comments/Well Conditon
MWC007	Mar-09	57.58						TOC-N				
WCC_05S	Mar-09	59						TOC-N				
MWC004	Mar-09	58.39						TOC-N				
WCC_12S	Mar-09	57.72						TOC-N				
MWC022	Mar-09	57.71						TOC-N				
MWB020	Mar-09	56.48						TOC-N				
WCC_09S	Mar-09	61.38						TOC-N				
WCC_07S	Mar-09	58.52						TOC-N				
MWC023	Mar-09	57.69						TOC-N				
WCC_04S	Mar-09	58.41						TOC-N				
MWB007	Mar-09	57.34						TOC-N				
TMW_14	Mar-09	66.22						TOC-N				
TMW_15	Mar-09	64.36						TOC-N				
XMW-09	Mar-09	60.4						TOC-N				
CMW002	Jun-09	60.78						TOC-N				
MWB019	Mar-09	62.56						TOC-N				
MWC017	Mar-09	62.92						TOC-N				
IRZMW001B	Mar-09	63.59						TOC-N				
IRZCMW002	Jun-09	63.38						TOC-N				
IRZMW001A	Mar-09	63.63						TOC-N				

AVOCET ENVIRONMENTAL, INC.

Groundwater Monitoring Well Gauging Sheet

Project Name: Boeing C-6 September 2009 Gauging Event **Project Manager:** Michael Rendina **Project No.:** 1155.010

Location: Torrance, CA **Field Personnel:** Various **Date:** 9/8/2009

CGI Instrument ID: RKI Eagle Multi-Gas Detector **PID Instrument ID:** MiniRAE 2000 **Solinst ID:** Various

Field Conditions: Partly cloudy and cool (mean temp. 70.5°F), calm to light winds (3 to 16 mph) from the west, 74% humidity.

Sampling Methods: Initial CGI/PID collected approx. 1" above center of casing immediately after opening. Measure elapsed time when CGI ≤ 2%LEL

Well ID	Previous Measurement Date	Previous Depth to Water	Time	Well Diameter	PID (ppm)	Initial CGI (%LEL)	Time to Disperse (mm:ss)	Measurement Point	Depth to Water	Depth to Water #2	Change in DTW	Comments/Well Conditon
MWG003	Mar-09	61.35						TOC-N				
MWG004	Mar-09	60.55						TOC-N				
TMW_06	Mar-09	58.79						TOC-N				
MWB014	Mar-09	58.91						TOC-N				
CMW026	Jun-09	59.14						TOC-N				
MWC015	Mar-09	59.67						TOC-N				
IRZCMW001	Jun-09	59.24						TOC-N				
MW0005	Mar-09	59.16						TOC-N				
IWC001	Mar-09	60.65						TOC-N				
MWC024	Jun-09	59.34						TOC-N				
IRZCMW003	Jun-09	59.29						TOC-N				
IWC002	Mar-09	58.89						TOC-N				
EWC002	Mar-09	59.35						TOC-N				
XMW-19	Mar-09	56.26						TOC-N				
MWB013	Mar-09	61.62						TOC-N				
TMW_11	Mar-09	56.91						TOC-N				
CMW001	Mar-09	62.03						TOC-N				
TMW_10	Mar-09	56.63						TOC-N				
MWC021	Mar-09	61.44						TOC-N				
MWG001	Mar-09	62.38						TOC-N				
MWC009	Mar-09	60.8						TOC-N				
MWG002	Mar-09	63.4						TOC-N				

AVOCET ENVIRONMENTAL, INC.
16 Technology Drive, Suite 154
Irvine, California 92618-2327
TEL (949) 296-0977
FAX (949) 296-0978

Boeing CoC No. AV20091110B

CHAIN OF CUSTODY RECORD

Project Information:	
Site Name	Boeing Former C-6 Facility, Sitewide Annual Sampling, September 2009
Site Address	Los Angeles, CA
Project No.	1155.010
Project Manager	Michael Rendina
Sampled By	DML
Turn-Around-Time	Standard TAT

Sample Identification	Sample Date	Sample Time	Matrix	No. of Cntnrs.	Lab I.D. Number	Analyses: VOCs EPA 8260B	Comments
MWB020_WG20090911_01	09/11/09	7:32	WATER	3		X	
WCC_09S_WG20090911_01	09/11/09	8:05	WATER	3		X	
MWC009_WG20090911_01	09/11/09	8:50	WATER	3		X	
MWC009_WG20090911_02	09/11/09	8:50	WATER	3		X	
WCC_07S_WG20090911_01	09/11/09	10:53	WATER	3		X	*Target this sample for Tier I Data Validation*
MWB019_WG20090911_01	09/11/09	9:50	WATER	3		X	
MWB019_WG20090911_02	09/11/09	9:50	WATER	3			
MWC017_WG20090911_01	09/11/09	10:25	WATER	3		X	
MWG002_WG20090911_01	09/11/09	11:26	WATER	3		X	
MWB027_WG20090911_01	09/11/09	12:02	WATER	3		X	*Target this sample for Tier II Data Validation*
MWC023_WG20090911_01	09/11/09	12:20	WATER	3		X	*Target this sample for Tier I Data Validation*
WCC_04S_WG20090911_01	09/11/09	11:20	WATER	3		X	*Target this sample for Tier III Data Validation*
WCC_04S_WG20090911_02	09/11/09	11:20	WATER	3		X	
MWB007_WG20090911_01	09/11/09	11:55	WATER	3		X	*Target this sample for Tier I Data Validation*
WCC_03S_WG20090911_01	09/11/09	10:29	WATER	3		X	

Relinquished by		Company	Received by		Company
Printed Name:	Date:	Avocet Environmental, Inc.	Printed Name:	Date:	
Signature:	Time:		Signature:	Time:	
Printed Name:	Date:		Printed Name:	Date:	
Signature:	Time:		Signature:	Time:	
Printed Name:	Date:		Printed Name:	Date:	
Signature:	Time:		Signature:	Time:	

Sample Receipt	Billing Information	
Total Containers:	Bill To: Michael Rendina, P.G. AVOCET ENVIRONMENTAL, INC. 16 Technology Dive, Suite 154 Irvine, CA 92618-2327	Please bill to Avocet. Please report electronically in accordance with Boeing standards. If any questions, please call Mike Rendina @ (949) 296 0977 Ext.103
Temperature °C: °F:		
COC Seal (Y/N/NA)		

\\server2\SHARED\Projects\1155 Boeing Former C-6 Facility\Groundwater Monitoring\September 2009\Master COC_AV200909

AVOCET ENVIRONMENTAL, INC.
16 Technology Drive, Suite 154
Irvine, California 92618-2327
TEL (949) 296-0977
FAX (949) 296-0978

Boeing CoC No. AV20091110A

CHAIN OF CUSTODY RECORD

Project Information:	
Site Name	Boeing Former C-6 Facility, WDR Sampling, September 2009
Site Address	Los Angeles, CA
Project No.	1155.010
Project Manager	Michael Rendina
Sampled By	
Turn-Around-Time	Standard TAT

Sample Identification	Sample Date	Sample Time	Matrix	No. of Cntnrs.	Lab I.D. Number	VOCs EPA 8260B	TOC EPA 9060 Modified	Volatile Fatty Acids 24 Hr HT IC Method 8M23G (Microseeps)	Dissolved Hydrocarbon Gases (DHGs) Methane, Ethane, Ethene - RSK 175	Alkalinity SM2320B	Anions (NO3, NO2, SO4) EPA 300.0	Anions (Chlorides) EPA 300.0	Total Dissolved Solids (TDS) SM2540C	DHC 16S by qPCR analysis (North Wind) 24Hr HT						48HR HT for NO_3 Comments
MWB006_WG20090910_01	09/10/09	7:50	WATER	12		X	X	X	X			X	X	X						
WCC_12S_WG20090910_01	09/10/09	8:30	WATER	12		X	X	X	X			X	X	X						
TMW_07_WG20090910_01	09/10/09	9:05	WATER	12		X	X	X	X			X	X	X						
AW0066UB_WG20090910_01	09/10/09	9:40	WATER	8		X	X		X		X									
AW0067UB_WG20090910_01	09/10/09	10:35	WATER	8		X	X		X		X									
WCC_06S_WG20090910_01	09/10/09	11:46	WATER	8		X	X		X		X									
AW0065UB_WG20090910_01	09/10/09	11:15	WATER	8		X	X		X		X									
AW0064UB_WG20090910_01	09/10/09	13:03	WATER	8		X	X		X		X									
EWB002_WG20090910_01	09/10/09	13:36	WATER	8		X	X		X		X									
TB_AV20090910_01	09/10/09	-	WATER	3		X														
EB_AV20090910_01	09/10/09	7:55	WATER	3		X														

Please forward VFA & qPCR analyses to identified laboratories ASAP.

Relinquished by	Company	Received by	Company
Printed Name: Date:	Avocet Environmental, Inc.	Printed Name: Date:	
Signature: Time:		Signature: Time:	
Printed Name: Date:		Printed Name: Date:	
Signature: Time:		Signature: Time:	
Printed Name: Date:		Printed Name: Date:	
Signature: Time:		Signature: Time:	

Sample Receipt	Billing Information	
Total Containers	Bill To: Michael Rendina, P.G. AVOCET ENVIRONMENTAL, INC. 16 Technology Dive, Suite 154 Irvine, CA 92618-2327	DHC PCR Analyses require **overnight** delivery to NorthWind in Pittsburgh, PA Primary DHG analyses will continue to be analyzed by ATL. Please bill to Avocet. Please report electronically in accordance with Boeing standards. If any questions, please call Mike Rendina @ (949) 296 0977 Ext.103
Temperature °C: °F:		
COC Seal (Y/N/NA)		

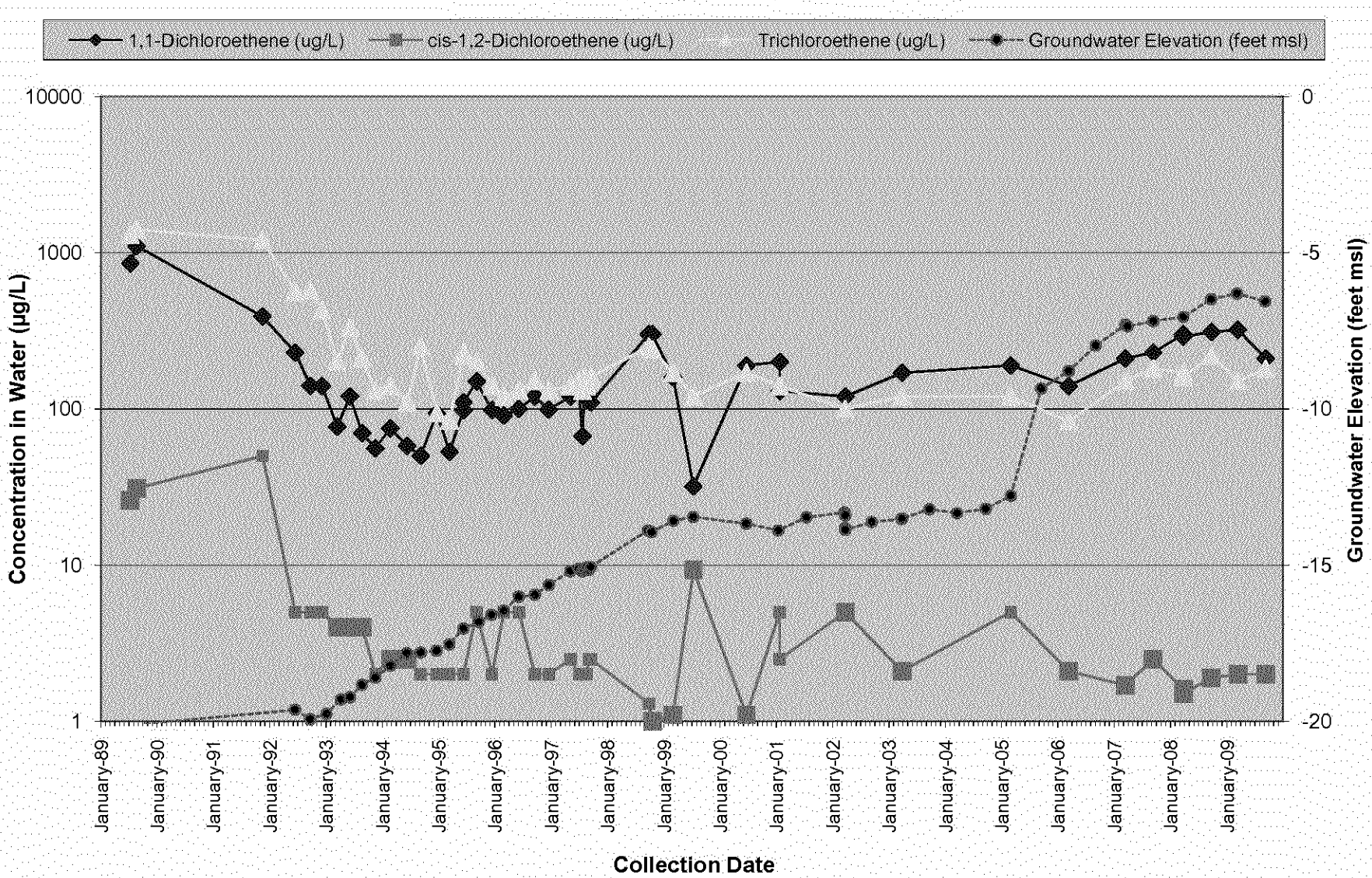
\\server2\SHARED\Projects\1155 Boeing Former C-6 Facility\Groundwater Monitoring\September 2009\master coc_av200909

Appendix B

Water Quality Hydrographs

AVOCET
ENVIRONMENTAL, INC.

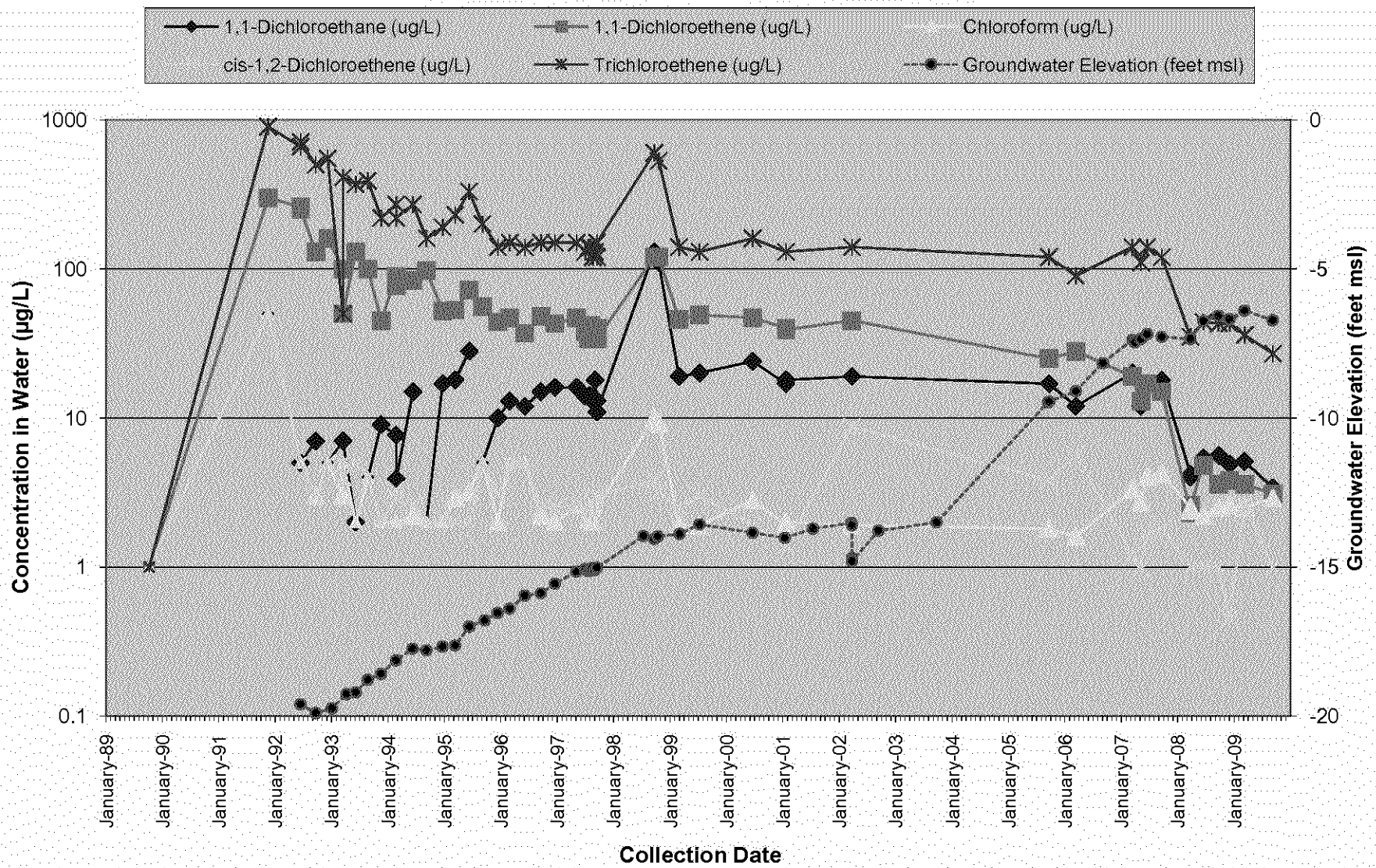
Water Quality vs. Time - WCC_07S
Boeing Former C-6 Facility, Torrance, CA



NOTE: Detects are indicated by large (8-point) data markers. The legend displays small (5-point) non-detect data markers for reference.

AVOCET ENVIRONMENTAL, INC.

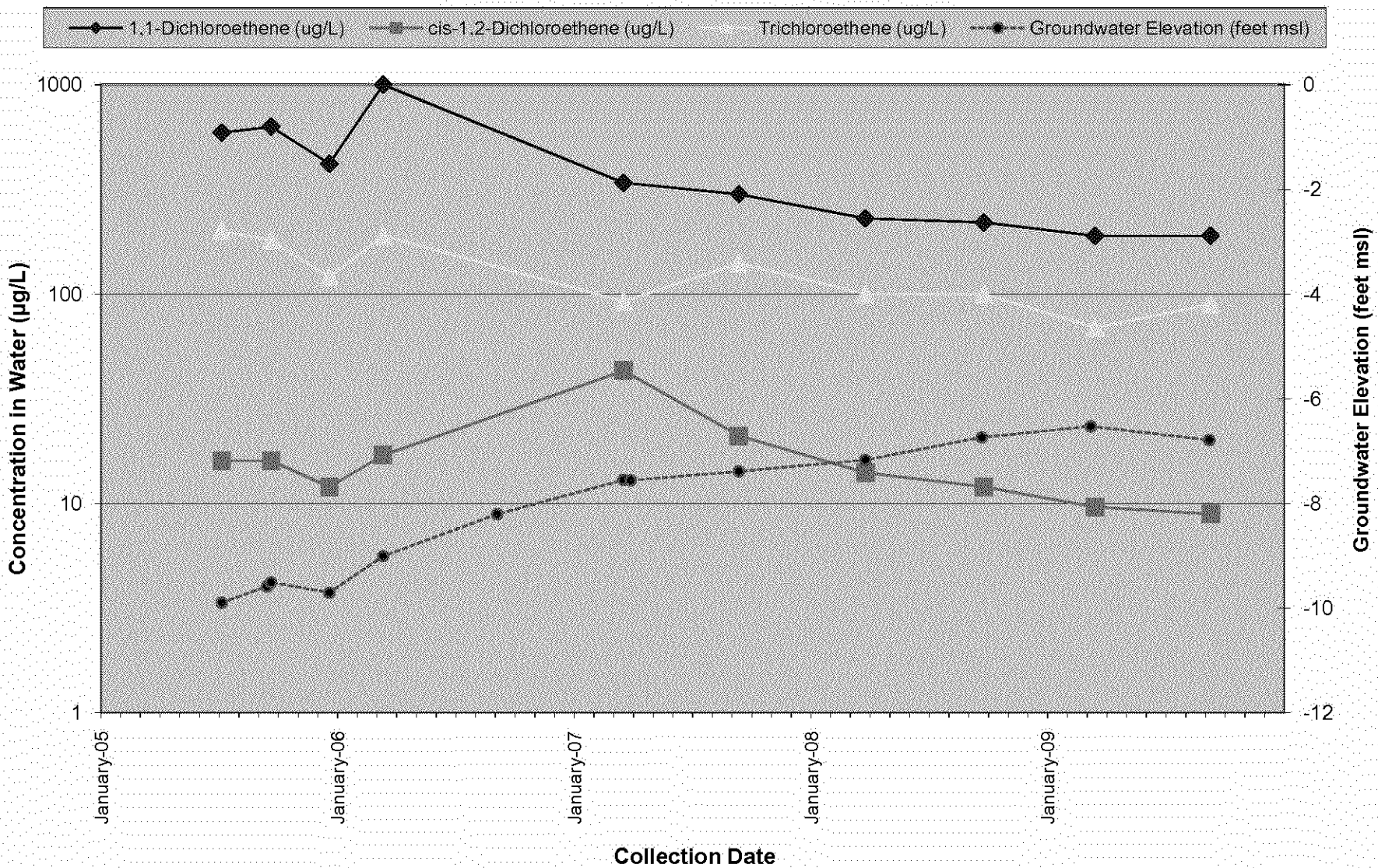
Water Quality vs. Time - WCC_12S
Boeing Former C-6 Facility, Torrance, CA



NOTE: Detects are indicated by large (8-point) data markers. The legend displays small (5-point) non-detect data markers for reference.

AVOCET ENVIRONMENTAL, INC.

Water Quality vs. Time - MWC004
Boeing Former C-6 Facility, Torrance, CA



NOTE: Detects are indicated by large (8-point) data markers. The legend displays small (5-point) non-detect data markers for reference.

AVOCET ENVIRONMENTAL, INC.